

REMARKS

Applicants would like to thank the Examiner for consideration of the present application. In the office action mailed November 3, 2004, Claims 1-31 were pending for consideration. Of these, Claims 1-24 and 28-31 were rejected by the Examiner as allegedly obvious in view of one or more references under 35 U.S.C. § 103, and Claims 25-27 were objected to as being dependent upon a rejected claim, but were indicated to be allowable if rewritten in independent form. While Applicant very much appreciates the indication of allowable subject matter, Applicant would like to take this opportunity to bring several points that distinguish the present claims over the cited references to the Examiner's attention.

35 U.S.C. § 103

As noted above, Claims 1-24 and 28-31 have been rejected under 35 U.S.C. § 103 as allegedly obvious in view of U.S. Patent No. 6,102,024 to Buljan et al. (hereinafter "Buljan"), in combination with U.S. Patent No. 4,916,869 to Oliver (hereinafter "Oliver"). Applicant respectfully submits that the rejected claims are patentable over the cited references for the reasons set forth below, and that the rejection should be withdrawn.

Before discussing the rejection, it is thought proper to briefly state what is required to sustain such a rejection. The issue under § 103 is whether the Patent Office has stated a case of *prima facie* obviousness. "The PTO has the burden under § 103 to establish a *prima facie* case of obviousness." In re Fine, 837 F.2d 1071, 5 U.S.P.Q.2d 1596, 1598 (Fed. Cir. 1988). To satisfy this burden, the PTO must meet the criteria set out in M.P.E.P § 706.02(j):

... three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on applicant's disclosure. *In re Vaeck*, 947 F.2d 488, 20 U.S.P.Q.2d 1438 (Fed. Cir. 1991).

Moreover, the obviousness analysis must comply with the statutory scheme as explained by the Supreme Court in *Graham v. John Deere Co.*, 383 U.S. 1, 17 (1966), namely, consideration must be given to: (1) the scope and content of the prior art, (2) the differences between the prior art and the claimed invention, (3) the level of ordinary skill in the pertinent art, and (4) additional evidence, which may serve as indicia of non-obviousness.

With the above background in mind, Applicant contends that the Patent Office has failed to meet its burden of establishing a *prima facie* case of obviousness. Specifically, the Office has failed to show that each and every element of the claimed invention is contained in the combination of references. Further, Applicants contend that there is no motivation to combine the references and that the combination is based on hindsight.

Applicants' Invention

As recited in independent Claims 1, 17, and 31, the present invention includes a device and associated method wherein superabrasive particles which are coated with a solidified coating of molten braze alloy are attached to a wire with an organic binder. It is important to note that the coated superabrasive particles are held in the organic matrix in the final tool which is a wire saw.

The Buljan Reference

Buljan teaches a wire saw which has a "core of metal wire and a single layer of abrasive grains affixed *directly thereto* by a brazed metal bond." [emphasis added] Col. 2, lines 44-47.

During formation of the wire saw, a “fugitive liquid binder” can be mixed with a powder of a brazing alloy to form a paste. The paste is then coated on the wire and the coating and wire is then heated. Notably, the fugitive liquid binder is “sufficiently volatile to substantially completely evaporate and/or pyrolyze during brazing without leaving a residue that might interfere with the function of the bond.” Col. 5, lines 57-60. Thus, the final wire saw has abrasive grains *directly brazed* to a metal wire which is free of organic material, and the binder material does not remain in the final tool as the primary means of holding the abrasive grains onto the wire.

The Oliver Reference

Oliver teaches an abrasive structure which involves the use of a temporary resin binder to temporarily bind the setting material, i.e. a brazing metal powder, and the abrasive particulates together. During formation of the abrasive structure, the temporary “hydrocarbon resin binder is volatile such that it may be driven from the structure at a first relatively low predetermined temperature. The structure is brazable to a tool surface by the infiltration of a brazing material...at a second higher predetermined temperature.” See col. 4, lines 9-31. Thus, the Oliver reference is similar to the Buljan reference with respect to the use of a *temporary* or fugitive binder. The final tool has abrasives brazed to the tool, and not held permanently in place with the binder.

Obviousness Arguments

Applicants submit that the combination of these references fails to teach each and every element of the present invention. Particularly, Buljan fails to teach a wire saw having an organic binder as part of the final tool which is used to attach or hold superabrasive particles. The fugitive liquid binder of Buljan does not satisfy the claimed limitation. Specifically, the binder of Buljan is completely removed during formation of the wire saw. Applicant is claiming a wire saw and a wire

saw is not produced until it is in a form suitable for use as a cutting implement. Thus, Buljan does not disclose a *wire saw* having an organic binder. Rather, Buljan merely discloses a wire having a binder which is not yet a wire saw. Based on this insufficiency alone, the rejection should be withdrawn.

Further, Buljan fails to disclose a wire saw having coated superabrasive particles which are coated with a “solidified coating of molten braze alloy.” At most, Buljan discloses a wire having abrasive particles attached thereto in a matrix of fugitive liquid binder and metal powder. The fugitive liquid binder is completely burned off long before the metal powder becomes molten. Therefore, in Buljan the fugitive liquid binder cannot coexist with a molten state of the metal alloy. As such, the Buljan reference fails to teach or suggest each and every limitation of the claimed invention.

The introduction of Oliver does not remedy this defect and presents no additional subject matter of the claimed invention. As a result, the Applicant respectfully submits that the Patent Office has failed to establish a *prima facie* case of obviousness, and requests that this rejection be removed.

In addition, with respect to Claims 17 and 31, neither Buljan nor Oliver disclose or suggest curing of an organic binder as required by the claimed invention. In fact, the listing of suitable fugitive liquid binders in Buljan (col. 6, lines 1-9) emphasize the distinction from the present invention. Specifically, these materials are chosen such that they can be dried and then readily burned off prior to brazing of the metal powder. Contrary to the Examiner’s assertion, these references do not disclose “curing the coated particles to a wire.” In Buljan, these binders are not cured, but are rather destroyed. Applicant notes that Oliver does disclose curing the binder to form

an intermediate composite structure. Col. 7, lines 18-20. However, this composite structure is not a wire saw, nor is it a final abrasive tool. Rather, the composite structure is an intermediate material which is then placed on a tool substrate and heated to *completely remove* the organic portions and to braze and infiltrate the metal powders to form a final tool. Col. 7, lines 21-56. Thus, Oliver merely discloses abrasive particles temporarily held within an organic matrix, not to a wire or any other substrate. Regardless, the abrasive particles are further not coated with a “solidified coating of a molten braze alloy” as claimed by the present invention.

Further, with respect to Claims 17 and 31, neither Buljan nor Oliver disclose “forming a mixture of *coated* superabrasive particles and organic binder.” As mentioned above, the cited references fail to teach a condition where coated particles and organic binder can coexist, since the binder in those references is merely acting as a temporary binder which is burned off prior to melting of the metal powder. The fugitive organic binders are also not a permanent matrix for holding the particles in the final wire saw tool.

Thus, in summary, there is no teaching or suggestion in Buljan and Oliver, either alone or in combination, to guide or motivate one of ordinary skill in the art to arrive at Applicants’ invention of an organic bonded abrasive wire saw. Accordingly, Applicant respectfully submits that the obviousness rejection lacks a teaching or suggestion of each and every element of the claimed invention. Since the Patent Office has not met its initial burden of making a *prima facie* case, Applicant respectfully requests that the rejection be withdrawn.

Conclusion

In view of the foregoing, Applicant believes that presently pending claims 1-31 present allowable subject matter and allowance is respectfully requested. If any impediment to the allowance of these claims remains after consideration of the above remarks, and such impediment could be addressed during a telephone interview, the Examiner is invited to telephone either Mr. David Osborne, or in his absence, the undersigned attorney at (801) 566-6633, so that such issues may be resolved as expeditiously as possible.

Please charge any additional fees except for Issue Fee or credit any overpayment to Deposit Account No. 20-0100.

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Respectfully submitted,



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